REMARKS

The final Office action of 26 January 2006 (Paper No. 20060119) has been carefully considered.

Claims 1 thru 6 and 8 thru 12 are being amended. Thus, claims 1 thru 6 and 8 thru 12 are pending in the application.

In paragraph 1 of the final Office action, the Examiner rejected claims 1 thru 6 and 8 thru 12 under 35 U.S.C. §102 for alleged anticipation by Horiuchi, U.S. Patent No. 5,220,597. For the reasons stated below, it is submitted that the invention recited in the claims, as now amended, is distinguishable from the prior art cited by the Examiner so as to preclude rejection under 35 U.S.C. §102 and/or §103.

The present invention relates to a key signal scanning apparatus of a complex telephone and, more particularly, to a key signal scanning apparatus of a complex telephone for scanning a key signal without a reciprocal influence when external power is supplied and not supplied. A separator circuit is installed between a main microprocessor which scans the key signal when external power is supplied and a sub microprocessor which scans the key signal when external power is not supplied.

The key signal scanning apparatus of a complex telephone comprises: a keypad having plural row ports, plural column ports, and plural keys for generating a key signal

in accordance with pressing of a key by a user; a main microprocessor having row output ports and column input ports, and which operates by externally supplied power for supplying a timing signal to the row ports of the keypad by using the row output ports, for receiving the key signal from the column ports of the keypad by using the column input ports, for detecting a key pressed by the user by scanning the received key signal, and for outputting a dialing signal corresponding to the scanned key; a sub microprocessor which operates when power is not supplied from an external source for outputting a dialing signal generated according to the key signal inputted from the row ports and the column ports of the keypad; a first separator circuit comprising diodes for cutting off current flow to the row output ports of the main microprocessor from the row ports of the sub microprocessor; and a second separator circuit comprising bipolar transistors for cutting off current flow to the column ports of the sub microprocessor from the column input ports of the main microprocessor when power is not supplied from the external source. The present invention can scan the key signal without reciprocal influence when external power is supplied and not supplied by provision of a separator circuit between the main microprocessor scanning the key signal when external power is supplied and the sub microprocessor scanning the key signal when external power is not supplied.

The sole reference cited against the claims of the application is Horiuchi, U.S. Patent No. 5,220,597, entitled *DIALING APPARATUS FOR POWER FAILURE EXTENSION TELEPHONE SET OF KEY TELEPHONE SYSTEM*, issued on June 15, 1993. Horiuchi '597 discloses a dialing apparatus used for a power failure extension

telephone set in a key telephone system. The power failure extension telephone set is driven by power supplied from a key service unit so as to function as an extension telephone set when power is supplied to the key service unit, but directly connected to an office telephone line so as to function as an individual telephone set when power is not supplied to the key service unit. The dialing apparatus comprises a dial switch of single contact-layer structure and a control switch circuit connected to the dial switch and changed over according to the power supply or power failure condition of the key service unit. That is, when power is supplied to the key service unit, the control switch circuit connects the dial switch to a control circuit. This control circuit is activated by power supplied from the key service unit and detects the state of the dial switch to transmit a control signal to the key service unit. On the other hand, when power is not supplied to the key service unit, the control switch circuit connects the dial switch to a dial signal transmit circuit. This dial signal transmit circuit is activated by power supplied through an office telephone line and detects the state of the dial switch whenever a handset is off-hooked, so as to transmit a call to the office telephone line.

In the final Office action, the Examiner stated the following correspondence between claimed elements of this application and elements disclosed in Figures 2 and 6 of Horiuchi '597:

Elements of claims 1 and 9	Horiuchi '597
Keypad	Dial switch 31
Main microprocessor	Control circuit 19
Sub microprocessor	Dial signal transmit circuit 20

Elements of claims 1 and 2	Horiuchi '597
First separator circuit	Diode group 22
Second separator circuit	CMOS switch 211
Third separator circuit	CMOS switch 212

Elements of claim 9	Horiuchi '597
First separator circuit	CMOS switch 211
Second separator circuit	CMOS switch 212

However, whereas independent claims 1 and 9 recite that the main microprocessor receives a key signal from the column ports of the keypad, Horiuchi '597 does not disclose any means for the control circuit 19 (main microprocessor) of Figure 2 to receive a key signal from the column ports 33 of the dial switch 31 (the keypad). In fact, the diode 22 blocks such a key signal from reaching the control circuit 19, and thus Horiuchi '597 teaches away from the invention in this respect.

In addition, whereas independent claim 1 recites that diodes cut off current flow from the row ports of the sub microprocessor to the row output ports of the main microprocessor, the diode group 22 of Horiuchi '597 (Figure 2) connects the column

output port of control circuit 19 (main microprocessor) to the column inputs of dial switch 31 (keypad) for the purpose of **transmitting** sequential pulses thereto (see column 6, lines 36-40 of Horiuchi '597). Thus, the diode group 22 does not function in the same manner as the diodes of claim 1.

In the latter regard, it should be noted that Horiuchi '597 requires a diode group, that is, a diode 22 to cut off current flow from control circuit 19 to dial signal transmit circuit 20, and another diode 23 to cut off current flow from dial signal transmit circuit 20 to control circuit 19. In contrast, in the invention, only diodes acting in one direction are needed to cut off current flow from the row ports of the sub microprocessor to the row output ports of the main microprocessor.

It should also be noted that the diodes of the present invention are different from the diode group of the cited reference, Horiuchi '597. That is, in the present invention, each diode cuts off current flow from a row port of the sub microprocessor to a row output port of the main microprocessor. In contrast, in Horiuchi '597, only two diodes cut off current flow.

Furthermore, whereas independent claim 1 recites that bipolar transistors cut off current flow from the column input ports of the main microprocessor to the column ports of the sub microprocessor, CMOS switch 211 of Figure 6 of Horiuchi '597 connects row signal line 34 of dial switch 31 (keypad) to control circuit 19 (main microprocessor) when

external power is supplied. Thus, the CMOS switch 211 does not function in the same manner as the bipolar transistors of claim 1.

Moreover, whereas dependent claim 2 recites that a sub separator circuit cuts off current flow from the column ports of the keypad to the column ports of the sub microprocessor when external power **is supplied**, the CMOS switch 212 of Figure 6 of Horiuchi '597 connects row signal line 34 of dial switch 31 (keypad) to dial signal transmit circuit 20 (sub microprocessor) when external power **is not supplied** (*i.e.*, fails), and thus the CMOS switch 212 does not function in the same manner as the sub separator circuit of claim 2.

It should also be noted that, in Horiuchi '597, the CMOS switch 212 is a necessary element, whereas the recited sub separator circuit of claim 2 is not. This further distinguishes the invention from the prior art.

In addition, whereas independent claim 9 recites that bipolar transistors cut off current flow from the column input ports of the main microprocessor to the column ports of the sub microprocessor when external power is not supplied, the CMOS switch 211 of Horiuchi '597 (Figure 6) connects row signal line 34 of dial switch 31 (keypad) to control circuit 19 (main microprocessor) when external power is supplied, and the CMOS switch 211 in combination with CMOS switch 212 connects row signal line 34 of dial switch 31 (keypad) to signal transmit circuit 20 (sub microprocessor) when external power is not

supplied. Thus, switch 211 does not function in the same manner as the bipolar transistors of claim 9.

Furthermore, the bipolar transistors of the present invention are different from the CMOS switches 211 and 212 of Horiuchi '597 in that, in the invention, each bipolar transistor cuts off current flow from a column input port of the main microprocessor to a column port of the sub microprocessor when external power is not supplied, whereas the CMOS switches 211 and 212 operate entirely differently and do not perform such a function.

Finally, whereas independent claim 9 recites that resistances cut off current flow from the column ports of the keypad to the column ports of the sub microprocessor when external power **is supplied**, CMOS switch 212 of Horiuchi '597 (Figure 6) connects row signal line 34 of dial switch 31 (keypad) to dial signal transmit circuit 20 (sub microprocessor) when external power **is not supplied** (*i.e.*, fails). Thus, the CMOS switch 212 does not function in the same manner as the resistances of claim 9.

Furthermore, as mentioned above relative to dependent claim 2, the CMOS switch 212 of Horiuchi '597 is a necessary element, whereas the resistors of claim 9 are not. This further distinguishes the invention of claim 9 from the prior art.

Therefore, for the reasons stated above, a rejection under 35 U.S.C. §102 is clearly

not appropriate because Horiuchi '597 does not disclose **each element and function** as recited in the claims of this application.

In the final Office action, the Examiner admits that there are differences between the claimed invention and the disclosure of Horiuchi '597. For example, at the bottom of page 3 of the final Office action, the Examiner states that the row output ports and column input ports of the microprocessors in the invention "correspond to the column and row ports, respectively, of the control and dial signal transmit circuits disclosed by Horiuchi" (quoting from the last paragraph on page 3 of the final Office action). Thus, a rejection under 35 U.S.C. §102 is clearly inappropriate by the Examiner's own admission.

Moreover, in view of the differences between the claimed invention as outlined above, as well as the fact that the disclosure of Horiuchi '597 teaches away from the invention, as also discussed above, a rejection under 35 U.S.C. §103 is also inappropriate. In fact, Horiuchi '597 teaches away from the functions recited in the claims by assigning **other functions** to the elements which, according to the Examiner's analysis, correspond to recited elements of the claims.

In view of the above, it is submitted that the claims of this application are in condition for allowance, and early issuance thereof is solicited. Should any questions remain unresolved, the Examiner is requested to telephone Applicant's attorney.

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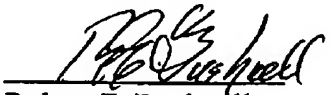
No fee is incurred by this Amendment After Final

Respectfully submitted,



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